CLAIM AMENDMENTS

1. (Previously Presented) A method for facilitating secure communications among multicast nodes in a telecommunications network, the method comprising the computer-implemented steps of:

receiving, at an authoritative node from a first node, a first request to store an encryption key, wherein the first request includes an identifier, and wherein the first node uses the encryption key to encrypt data that is multicast with the identifier to a plurality of second nodes;

in response to the first request,

the authoritative node storing the encryption key;

the authoritative node creating and storing an association between the encryption key and the identifier;

receiving, at the authoritative node from at least one second node of the plurality of second nodes, a second request to obtain the encryption key, wherein the second request includes the identifier;

in response to the second request,

based on the identifier included in the second request and the association between the encryption key and the identifier, the authoritative node retrieving the encryption key; and

the authoritative node sending the encryption key to the at least one second node for use in decrypting the encrypted data.

2. (Previously Presented) A method as recited in Claim 1, wherein:

the authoritative node is a trusted third party performs the steps of receiving the first request, storing the encryption key, creating and storing the association, receiving the second request, retrieving the encryption key, and sending the encryption key;

the first request is encrypted based on a first public key that is associated with the trusted third party;

the first request is signed with a first private key that is associated with the first node;

the first node is a router that acts as a multicast originator;
the plurality of second nodes is a plurality of routers that act as multicast receivers;
the trusted third party is selected from the group consisting of a certificate authority, a key distribution center, a key exchange authority, and a key exchange center;
the encryption key is selected from the group consisting of a second private key, a shared key, a pseudo-random string of bits, and a pseudo-random string of characters; and
the method further comprises the computer-implemented steps of:
prior to sending the encryption key,
encrypting the encryption key based on a second public key that is associated with the at least one second node; and
signing the encrypted encryption key with a third private key that is associated with the trusted third party.

3. – 5. (Cancelled)

6. (Previously Presented) A method as recited in Claim 1, further comprising the computer-implemented steps of:
registering a certificate that includes the encryption key and the identifier;
in response to the first request, associating an expiration time with the encryption key;
in response to the second request, determining based on the expiration time whether the encryption key has expired; and
when the encryption key has expired, revoking the certificate.

7. – 8. (Cancelled)

9. (Previously Presented) A method as recited in Claim 1, further comprising the computer-implemented step of:
generating the encryption key based on an Internet key exchange protocol with the first node.

10. (Cancelled)

11. (Original) A method as recited in Claim 1, wherein:
the first node uses the encryption key and Internet protocol security (IPsec) to encrypt the data that is multicast; and
the at least one second node decrypts the encrypted data based on the encryption key and IPsec.

12. (Previously Presented) A method as recited in Claim 1, further comprising the computer-implemented steps of:
storing a first list of nodes;
in response to the first request, determining whether the first node is included in the first list of nodes;
when the first node is included in the first list of nodes, performing the steps of storing the encryption key and creating and storing the association between the encryption key and the identifier;
in response to the first request, storing a second list of nodes;
in response to the second request, determining whether the at least one second node is included in the second list of nodes; and
when the at least one second node is included in the second list of nodes, performing the steps of retrieving and sending the encryption key.

13. – 14. (Cancelled)

15. (Original) A method as recited in Claim 1, wherein the encryption key is an old encryption key, the identifier is an old identifier, and the association is an old association, and further comprising the steps of:
in response to the first request, associating one or more criteria with the encryption key;

in response to the second request, determining based on the one or more criteria whether the encryption key is valid; and

when the encryption key is not valid,

receiving a third request to store a new encryption key, wherein the third request includes a new identifier, and wherein the new encryption key is used to encrypt additional data that is multicast with the new identifier to the plurality of second nodes;

in response to the third request,

storing the new encryption key;

creating and storing a new association between the new encryption key and the new identifier;

receiving, from at least one additional second node of the plurality of second nodes, a fourth request to obtain the new encryption key, wherein the fourth request includes the new identifier;

in response to the fourth request,

based on the new identifier included in the fourth request and the new association between the new encryption key and the new identifier, retrieving the new encryption key; and

sending the new encryption key to the at least one additional second node for use in decrypting the encrypted data.

16. (Cancelled)

17. (Original) A method as recited in Claim 1,

wherein:

the identifier is a session identifier;

the encrypted data is multicast with an originator identifier that is based on an identity of the first node;

the second request includes an unverified originator identifier; and

further comprising the computer-implemented steps of:

in response to the first request, associating the originator identifier with the session identifier; and

in response to the second request, determining whether the unverified originator identifier is valid based on the originator identifier and informing the at least one second node whether the unverified originator is valid.

18. – 19. (Cancelled)

20. (Original) A method as recited in Claim 1, wherein the identifier is selected from the group consisting of a hostname, an Internet protocol address, a media access control address, an Internet security protocol security parameter index, a first string of pseudo-random bits, a second string of pseudo-random characters, a third string of arbitrary bits, and a fourth string of arbitrary characters.

21. (CURRENTLY AMENDED) A method for encrypting communications among multicast nodes in a telecommunications network, the method comprising the computer-implemented steps of:

an originating node sending a first request to store an encryption key and an identifier ~~that is associated with the encryption key~~ to an authoritative node;

wherein the authoritative node, ~~that~~ in response to the first request, (a) stores the encryption key ~~and identifier~~ and ~~that~~ (b) creates and stores an association between ~~the encryption~~ the encryption key and the identifier;

the originating node encrypting data based on the encryption key; and

the originating node multicasting the encrypted data with the identifier to one or more receiving nodes, wherein:

at least one receiving node of the one or more receiving nodes (a) sends a second request to obtain the encryption key ~~use the identifier to retrieve the encryption key from~~ to the authoritative node, wherein the second request includes the identifier, and (b) decrypts the encrypted data based on the encryption key that the at least one receiving node receives from the authoritative node; and

the authoritative node, in response to the second request, (a) retrieves the encryption key, based on the identifier included in the second request and the association between the encryption key and the identifier, and (b) sends the encryption key to the at least one receiving node for use in decrypting the encrypted data.

22. (CURRENTLY AMENDED) A method for decrypting encrypted communications among multicast nodes in a telecommunications network, the method comprising the computer-implemented steps of:

a receiving node receiving from an originating node a multicast that includes encrypted data and an identifier, wherein:

the encrypted data is encrypted by the originating node based on an encryption key;

the authoritative node receives a first request from the originating node to store the encryption key, wherein the first request includes an identifier;

in response to the first request, the authoritative node (a) stores the encryption key and (b) creates and stores an association between the encryption key and the identifier;

the receiving node identifying the identifier from the multicast;

the receiving node sending a second request to obtain the encryption key that includes the identifier to ~~an~~ the authoritative node ~~for~~ to obtain an encryption key used by the originating node to encrypt the encrypted data, wherein:

the authoritative node, in response to the second request, (a) retrieves the encryption key, based on the identifier included in the second request and the association between the encryption key and the identifier, and (b) sends the encryption key for use in decrypting the encrypted data;

in response to sending the second request to the authoritative node, the receiving node receiving the encryption key; and

the receiving node decrypting the encrypted data based on the encryption key.

23. (Original) A method for a certificate authority to facilitate communications based on Internet protocol security (IPsec) among multicast nodes in a telecommunications network, the method comprising the computer-implemented steps of:

receiving, at the certificate authority from a first router that acts as a multicast originator, a first request to register an encryption key, wherein the first request includes a multicast session identifier and a list of authorized multicast receivers, and wherein the first router uses the encryption key to encrypt data based on IPsec and multicasts the encrypted data with the multicast session identifier to a plurality of second routers that act as multicast receivers;

in response to the first request, the certificate authority creating and storing a multicast session certificate that includes the encryption key, the multicast session identifier, and the list of authorized multicast receivers;

receiving, at the certificate authority from at least a particular second router of the plurality of second routers, a second request to obtain the encryption key, wherein the second request includes the multicast session identifier;

in response to the second request,

determining whether the particular second router is included in the list of authorized multicast receivers;

when the particular second router is included in the list of authorized multicast receivers,

based on the multicast session identifier included in the second request and the multicast session certificate, the certificate authority retrieving the encryption key; and

the certificate authority sending the encryption key to the particular second router for use in decrypting the encrypted data based on IPsec.

24. (Previously Presented) A computer-readable storage medium carrying one or more sequences of instructions for facilitating secure communications among multicast nodes in a telecommunications network, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

receiving, at an authoritative node from a first node, a first request to store an encryption key, wherein the first request includes an identifier, and wherein the first node uses the encryption key to encrypt data that is multicast with the identifier to a plurality of second nodes;

in response to the first request,

the authoritative node storing the encryption key;

the authoritative node creating and storing an association between the encryption key and the identifier;

receiving, at the authoritative node from at least one second node of the plurality of second nodes, a second request to obtain the encryption key, wherein the second request includes the identifier;

in response to the second request,

based on the identifier included in the second request and the association between the encryption key and the identifier, the authoritative node retrieving the encryption key; and

the authoritative node sending the encryption key to the at least one second node for use in decrypting the encrypted data.

25. (CURRENTLY AMENDED) A computer-readable storage medium carrying one or more sequences of instructions for encrypting communications among multicast nodes in a telecommunications network, cause the one or more processors to carry out the steps of:

an originating node sending a first request to store an encryption key and an identifier ~~that is associated with the encryption key~~ to an authoritative node;

wherein the authoritative node, ~~that~~ in response to the first request, (a) stores the encryption key ~~and identifier~~ and ~~that~~ (b) creates and stores an association between ~~the encryption~~ the encryption key and the identifier;

the originating node encrypting data based on the encryption key; and

the originating node multicasting the encrypted data with the identifier to one or more receiving nodes, wherein:

at least one receiving node of the one or more receiving nodes (a) sends a second request to obtain the encryption key ~~use the identifier to retrieve the encryption key from~~ to the authoritative node, wherein the second request includes the identifier, and (b) decrypts the encrypted data based on the encryption key that the at least one receiving node receives from the authoritative node; and

the authoritative node, in response to the second request, (a) retrieves the encryption key, based on the identifier included in the second request and the association between the encryption key and the identifier, and (b) sends the encryption key to the at least one receiving node for use in decrypting the encrypted data.

26. (Previously Presented) An apparatus for facilitating secure communications among multicast nodes in a telecommunications network, comprising:

means for receiving, at an authoritative node from a first node, a first request to store an encryption key, wherein the first request includes an identifier, and wherein the first node uses the encryption key to encrypt data that is multicast with the identifier to a plurality of second nodes;

means for the authoritative node storing the encryption key, in response to the first request;

means for the authoritative node creating and storing an association between the encryption key and the identifier, in response to the first request;

means for receiving, at the authoritative node from at least one second node of the plurality of second nodes, a second request to obtain the encryption key, wherein the second request includes the identifier;

means for the authoritative node retrieving the encryption key, in response to the second request and based on the identifier included in the second request and the association between the encryption key and the identifier; and

means for the authoritative node sending the encryption key to the at least one second node for use in decrypting the encrypted data, in response to the second request.

27. (CURRENTLY AMENDED) An apparatus for encrypting communications among multicast nodes in a telecommunications network, comprising:

means for an originating node sending a first request to store an encryption key and an identifier ~~that is associated with the encryption key~~ to an authoritative node;

wherein the authoritative node, ~~that~~ in response to the first request, (a) stores the encryption key ~~and identifier~~ and ~~that~~ (b) creates and stores an association between ~~the encryption~~ the encryption key and the identifier;

means for the originating node encrypting data based on the encryption key; and

means for the originating node multicasting the encrypted data with the identifier to one or more receiving nodes, wherein:

at least one receiving node of the one or more receiving nodes (a) sends a second request to obtain the encryption key ~~use the identifier to retrieve the encryption key from~~ to the authoritative node, wherein the second request includes the identifier, and (b) decrypts the encrypted data based on the encryption key that the at least one receiving node receives from the authoritative node; and

the authoritative node, in response to the second request, (a) retrieves the encryption key, based on the identifier included in the second request and the association between the encryption key and the identifier, and (b) sends the encryption key to the at least one receiving node for use in decrypting the encrypted data. the one or more receiving nodes use the identifier to retrieve the encryption key from the authoritative node and decrypt the encrypted data based on the encryption key.

28. (Previously Presented) An apparatus for facilitating secure communications among multicast nodes in a telecommunications network, comprising:

a processor;

one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:

receiving, at an authoritative node from a first node, a first request to store an encryption key, wherein the first request includes an identifier, and wherein the first node uses the encryption key to encrypt data that is multicast with the identifier to a plurality of second nodes;

in response to the first request,

the authoritative node storing the encryption key;

the authoritative node creating and storing an association between the encryption key and the identifier;

receiving, at the authoritative node from at least one second node of the plurality of second nodes, a second request to obtain the encryption key, wherein the second request includes the identifier;

in response to the second request,

based on the identifier included in the second request and the association between the encryption key and the identifier, the authoritative node retrieving the encryption key; and

the authoritative node sending the encryption key to the at least one second node for use in decrypting the encrypted data.

29. (CURRENTLY AMENDED) An apparatus for encrypting communications among multicast nodes in a telecommunications network, comprising:

a processor;

one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:

an originating node sending a first request to store an encryption key and an identifier ~~that is associated with the encryption key~~ to an authoritative node;

wherein the authoritative node, ~~that~~ in response to the first request, (a) stores the encryption key ~~and identifier~~ and ~~that~~ (b) creates and stores an association between ~~the encryption~~ the encryption key and the identifier;

the originating node encrypting data based on the encryption key; and

the originating node multicasting the encrypted data with the identifier to one or more receiving nodes, wherein:

at least one receiving node of the one or more receiving nodes (a) sends a second request to obtain the encryption key ~~use the identifier to retrieve the encryption key from~~ to the authoritative node, wherein the second request includes the identifier, and (b) decrypts the encrypted data based on the encryption key that the at least one receiving node receives from the authoritative node; and

the authoritative node, in response to the second request, (a) retrieves the encryption key, based on the identifier included in the second request and the association between the encryption key and the identifier, and (b) sends the encryption key to the at least one receiving node for use in decrypting the encrypted data.

30. (Previously Presented) An apparatus as recited in Claim 26, wherein:

the means for receiving the first request, storing the encryption key, creating and storing the association, receiving the second request, retrieving the encryption key, and sending the encryption key are included in a trusted third party;

the trusted third party is the authoritative node;

the first request is encrypted based on a first public key that is associated with the trusted third party;

the first request is signed with a first private key that is associated with the first node;

the first node is a router that acts as a multicast originator;

the plurality of second nodes is a plurality of routers that act as multicast receivers;

the trusted third party is selected from the group consisting of a certificate authority, a key distribution center, a key exchange authority, and a key exchange center;

the encryption key is selected from the group consisting of a second private key, a shared key, a pseudo-random string of bits, and a pseudo-random string of characters; and

the apparatus further comprises:

means for encrypting, prior to sending the encryption key, the encryption key based on a second public key that is associated with the at least one second node; and

means for signing, prior to sending the encryption key, the encrypted encryption key with a third private key that is associated with the trusted third party.

31. (Previously Presented) An apparatus as recited in Claim 26, further comprising:

means for registering a certificate that includes the encryption key and the identifier;

means for associating, in response to the first request, an expiration time with the encryption key;

means for determining, in response to the second request, based on the expiration time whether the encryption key has expired; and

means for revoking the certificate when the encryption key has expired.

32. (Previously Presented) An apparatus as recited in Claim 26, further comprising:

means for generating the encryption key based on an Internet key exchange protocol with the first node.

33. (Previously Presented) An apparatus as recited in Claim 26, wherein:

the first node uses the encryption key and Internet protocol security (IPsec) to encrypt the data that is multicast; and

the at least one second node decrypts the encrypted data based on the encryption key and IPsec.

34. (Previously Presented) An apparatus as recited in Claim 26, further comprising:

means for storing a first list of nodes;

means for determining, in response to the first request, whether the first node is included in the first list of nodes;

means for causing, when the first node is included in the first list of nodes, the storing of the encryption key and the creating and storing of the association between the encryption key and the identifier;

means for storing, in response to the first request, a second list of nodes;

means for determining, in response to the second request, whether the at least one second node is included in the second list of nodes; and

means for causing, when the at least one second node is included in the second list of nodes, the retrieving and sending of the encryption key.

35. (Previously Presented) An apparatus as recited in Claim 26, wherein the encryption key is an old encryption key, the identifier is an old identifier, and the association is an old association, and further comprising:

means for associating, in response to the first request, one or more criteria with the encryption key;

means for determining, in response to the second request, based on the one or more criteria whether the encryption key is valid;

means for receiving, when the encryption key is not valid, a third request to store a new encryption key, wherein the third request includes a new identifier, and wherein the new encryption key is used to encrypt additional data that is multicast with the new identifier to the plurality of second nodes;

means for storing, in response to the third request, the new encryption key;

means for creating and storing, in response to the third request, a new association between the new encryption key and the new identifier;

means for receiving, from at least one additional second node of the plurality of second nodes, a fourth request to obtain the new encryption key, wherein the fourth request includes the new identifier;

means for retrieving, in response to the fourth request, the new encryption key, based on the new identifier included in the fourth request and the new association between the new encryption key and the new identifier; and

means for sending, in response to the fourth request, the new encryption key to the at least one additional second node for use in decrypting the encrypted data.

36. (Previously Presented) An apparatus as recited in Claim 26,
wherein:
the identifier is a session identifier;
the encrypted data is multicast with an originator identifier that is based on an identity of the first node;
the second request includes an unverified originator identifier; and
further comprising:
means for associating, in response to the first request, the originator identifier with the session identifier; and
means for determining, in response to the second request, whether the unverified originator identifier is valid based on the originator identifier and informing the at least one second node whether the unverified originator is valid.

37. (Previously Presented) An apparatus as recited in Claim 26, wherein the identifier is selected from the group consisting of a hostname, an Internet protocol address, a media access control address, an Internet security protocol security parameter index, a first string of pseudo-random bits, a second string of pseudo-random characters, a third string of arbitrary bits, and a fourth string of arbitrary characters.

38. (Previously Presented) An apparatus as recited in Claim 28, wherein:
the apparatus is part of a trusted third party;
the trusted third party is the authoritative node;
the first request is encrypted based on a first public key that is associated with the trusted third party;
the first request is signed with a first private key that is associated with the first node;
the first node is a router that acts as a multicast originator;
the plurality of second nodes is a plurality of routers that act as multicast receivers;
the trusted third party is selected from the group consisting of a certificate authority, a key distribution center, a key exchange authority, and a key exchange center;

the encryption key is selected from the group consisting of a second private key, a shared key, a pseudo-random string of bits, and a pseudo-random string of characters; and

the apparatus further comprises one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:

prior to sending the encryption key,

encrypting the encryption key based on a second public key that is associated with the at least one second node; and

signing the encrypted encryption key with a third private key that is associated with the trusted third party.

39. (Previously Presented) An apparatus as recited in Claim 28, further comprising one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:

registering a certificate that includes the encryption key and the identifier;

in response to the first request, associating an expiration time with the encryption key;

in response to the second request, determining based on the expiration time whether the encryption key has expired; and

when the encryption key has expired, revoking the certificate.

40. (Previously Presented) An apparatus as recited in Claim 28, further comprising one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the step of:

generating the encryption key based on an Internet key exchange protocol with the first node.

41. (Previously Presented) An apparatus as recited in Claim 28, wherein:

the first node uses the encryption key and Internet protocol security (IPsec) to encrypt the data that is multicast; and

the at least one second node decrypts the encrypted data based on the encryption key and IPsec.

42. (Previously Presented) An apparatus as recited in Claim 28, further comprising one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:
storing a first list of nodes;
in response to the first request, determining whether the first node is included in the first list of nodes;
when the first node is included in the first list of nodes, performing the steps of storing the encryption key and creating and storing the association between the encryption key and the identifier;
in response to the first request, storing a second list of nodes;
in response to the second request, determining whether the at least one second node is included in the second list of nodes; and
when the at least one second node is included in the second list of nodes, performing the steps of retrieving and sending the encryption key.

43. (Previously Presented) An apparatus as recited in Claim 28, wherein the encryption key is an old encryption key, the identifier is an old identifier, and the association is an old association, and further comprising one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:
in response to the first request, associating one or more criteria with the encryption key;
in response to the second request, determining based on the one or more criteria whether the encryption key is valid; and
when the encryption key is not valid,
receiving a third request to store a new encryption key, wherein the third request includes a new identifier, and wherein the new encryption key is used to encrypt additional data that is multicast with the new identifier to the plurality of second nodes;
in response to the third request,

storing the new encryption key;

creating and storing a new association between the new encryption key and the new identifier;

receiving, from at least one additional second node of the plurality of second nodes, a fourth request to obtain the new encryption key, wherein the fourth request includes the new identifier;

in response to the fourth request,

based on the new identifier included in the fourth request and the new association between the new encryption key and the new identifier, retrieving the new encryption key; and

sending the new encryption key to the at least one additional second node for use in decrypting the encrypted data.

44. (Previously Presented) An apparatus as recited in Claim 28,

wherein:

the identifier is a session identifier;

the encrypted data is multicast with an originator identifier that is based on an identity of the first node;

the second request includes an unverified originator identifier; and

further comprising one or more stored sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:

in response to the first request, associating the originator identifier with the session identifier; and

in response to the second request, determining whether the unverified originator identifier is valid based on the originator identifier and informing the at least one second node whether the unverified originator is valid.

45. (Previously Presented) An apparatus as recited in Claim 28, wherein the identifier is selected from the group consisting of a hostname, an Internet protocol address, a media access control address, an Internet security protocol security parameter index, a first string of pseudo-random bits, a second string of pseudo-random characters, a third string of arbitrary bits, and a fourth string of arbitrary characters.